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Industrial Finishing

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From the Editor's Desk

INFORMATION is very much in demand today by concerns that are now or expect to be identified with industrial activities. There is a general tendency among the leading personnel of industry to observe carefully, read more, and to make inquiries in a continual search for ideas and information that may be of value now or in the near future. Whatever holds forth the slightest promise of even small economies in methods, processes, materials, supplies, equipment or overhead, arrests attention; likewise, suggestions referring to design, color, selling and markets arouse interest. A lot of mental and physical preparation and tooling up for the future is going on. Management is putting its organization in shape to produce attractive articles of merit, promptly and profitably, when orders again begin to be placed in greater volume.

PAINT, varnish and lacquer sales showed an upturn in September over August of this year. A Department of Commerce report reveals that the total sales reported by 588 establishments are about 2½% greater for September than August. The amount for September is $21,925,225 against $21,323,143 for August. A breakdown of the classified figures shows the chief gain to be in trade sales reported by 315 concerns; the gain is about 6%. The industrial sales reported by these same 315 concerns are less for September than August—less by about 2%.

ONE of our New York correspondents reports that in every line of business now, there is a decided trend to novelties, especially those that can be retailed at a reasonable price. One of the latest of these, in the line of wood novelties, is natural wood ornaments or clips for use in women's costume wear. They are used as ornaments on hand bags in the form of clip initials; small attractive animals, especially Scottie dogs, leaves, etc., are used in different forms and sizes as ornaments on slippers, pumps, and hats—and various other costume uses are found for them. In fact any use made of similar ornaments and clips of metal can be made up in natural wood design, and here the rarer exotic woods work in beautifully and in harmony with costume color schemes. They may also be painted in the colors most in vogue, as Spanish tile, green, and other colors particularly in style. The very latest colors in vogue can be ascertained from the Textile Color Card Association of New York City.

Attractive necklaces are made of wood at present. In fact this costume idea of wood novelties has many angles. This is characteristic of the general effort being put forth by all progressive manufacturers to design and offer something new and attractive in order to captivate those who are in position to buy.

W. H. Rohr

Managing Editor

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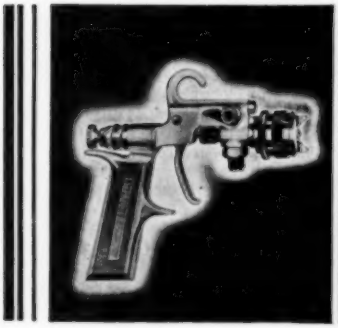

Send us a Sample

Then What?

By C. D. YOUNGS

REGARDLESS of which side of the fence the reader is placed, the question of the proper usage of samples should be of deep interest, especially since the past few years have shown it to be developing into a Frankenstein monster which has been a matter of deep concern to both users and manufacturers of industrial finishes.

Blame for the fact that this phase of industrial finishing relations has become such an annoyance to both parties of the transaction may be properly placed upon both parties, so this article is written with the hope that both sides may be equally benefited by a public washing of "dirty linen."

From the side of the finish user, perhaps it has been an easy outlet for a getaway from an overly persistent salesman who is endeavoring to replace a satisfactory material with one he highly recommends, yet which has been untried by the prospect. So it is an easy way simply to say:

"Send me a sample, and I'll test it out."

The salesman departs with this kiss-off, content to turn in a report to his firm that the prospect is interested and has requested certain samples, similar to products he is using, whether or not he believes he has a fair chance of selling them. In many instances the salesman does not stop to consider that the samples requested may be of an item not regularly manufactured by his company—that they may be of certain colors or shades and have other characteristics which will require a considerable outlay of time and study to produce. These things may perhaps render the cost of submitting the sample entirely out of proportion to the prospective profit involved in the transaction.

So some salesmen, in their eagerness to make a showing, and being blind to the profit end of the transaction, blithely turn in reports with recommendations grossly inflated as to the volume of business in prospect and the chances for making a sale. The finish manufacturer is put to an entirely unwarranted expense which he cannot get away from without giving the prospective customer the idea that he does not care for his business.

The troubles accompanying a casual request for, or an offer to submit samples of finishing materials, are many and varied for in addition to the needless expense to which the manufacturer is put may be the time lost by the salesman and the buyer—which time might be well put into more productive effort. Then, if nothing definite comes from the sample negotiation, there is likely to be

an element of ill feeling on both sides.

Any salesman capable of calling intelligently upon an industrial finish buyer should have sufficient perception to decide whether or not a request for samples is really meant, or if it is only a means of turning him down. But if he is satisfied that there is a legitimate interest in the request for samples he should deliver them personally and insist upon being present at the time of the tests.

This may be accomplished in a tactful manner but he should be insistent upon receiving a definite date for trial, and should be there at that time, ready to see that his samples are given a fair test and to assist in any difficulties that may come up.

The extent of this problem will surprise one who is not in touch with a number of salesmen or finish users. I happen to be connected with a firm that uses certain types of finishing materials, mostly baking finishes, and lately being desirous of making changes in several items we asked several manufacturers to send around their salesmen. Representatives came singly and en masse—even in legion—and each and every one was taken on a tour of the plant, shown the different ways in which the materials were to be used, and given definite data regarding requirements. They were requested to send small samples of materials desired, based upon explicit information as to use, mixing, and baking time.

The result was most discouraging to us!

Our Sample Experience

A large number of samples were received by mail, truck and personal delivery, *but in not a single case were they accompanied by any suggested methods as to their use.* In fact, well over 90% of the salesmen involved stated we were to go ahead and use their goods according to our usual methods, or else we were to experiment at various temperatures until we hit upon the right procedure. Not one single man submitted a regular procedure for the use of his products, or any schedule for mixing and baking. The finish manufacturers' representatives simply submitted a certain volume of liquid and left the rest to us. Since our baking schedules call for temperatures ranging from 135° to nearly 600° F., the effort was not worth the results.

Frankly, the failure of many industrial salesmen to produce has seemed to us to be largely because they either have no definite knowledge of their materials, or else they are too indolent to take time to go into their proposition thoroughly with a prospect who has requested samples with the idea of trying them out.

Our finish business may be considered as not amounting to a great deal, but in the present times of depression it runs from $600 to $1,000 a month, and it seems to me that this is a nice volume for any salesman to get in these times, and well worth his study.

In our plant every salesman is welcomed and given a hearing, insofar as he confines himself to the issues involved. We have no time for dirty stories, for propositions tending to relieve the world of its present ills, nor are we interested during working hours in the latest sporting news.

If we feel we need a change in materials, we request samples, after we are led to believe they may fill our needs; but in the

follow-up of these samples, we find manufacturers, both large and small woefully lacking.

The Other Side

So much for the diatribe against the sales end of the sample evil! Now let us look at the responsibility of the user, who is responsible for the thoughtlessness with which he requests samples he never intends to try out. This is not right. The finish buyer can get rid of a salesman by telling him definitely he is not interested at the time, without resorting to the request for samples.

Furthermore, he should make it a rule to never test or try out samples without a capable representative of the manufacturer being present, because there is a wide variation in the mixing, reduction and application of materials of different manufacture.

If both parties will work in harmony, with the idea of each one helping the other, much will be done to either eradicate or minimize the sample evil.

Cleaning Fan Blades

One of the major annoyances of the spray finisher, working in a booth where the fan blades are not kept clean, is the flying back of particles of oxidized materials onto his work or his person. For this reason all spray operators should be interested in the cleanliness of the exhaust fan blades.

If these blades are made of aluminum it is not practicable to place them in a lye bath; but by salvaging the thinner used for cleaning spray guns, and submerging the blades in this for an hour or two, or over-night, the excess accumulations of finishing materials will be throughly removed. If the blades are made of metal other than aluminum, a lye bath may be used with the assurance that it will do them no harm.

Even if there is no throw-back from dirty blades, it is advisable to keep them clean of adhering materials to maintain their running balance and avoid damage to the bearings and vibration of the entire fan structure. In some plants where lacquer is used exclusively, a thin coat of grease is put on the blades after every cleaning, this makes the next cleaning job easy.—H. B.

Represents H. V. Walker Co.

Mr. Ralph Palmer, formerly of E. I. Du Pont De Nemours & Co., has joined the sales organization of the Henry V. Walker Co., of Elizabeth, N. J., and is now representing this company in the Metropolitan District.

Solfo Chemical Co.'s Business Increased by Advertising

An interesting news letter from the Solfo Chemical Co., of Trenton, N. J., states:

"Our business has been growing to such an extent that within the next week we anticipate building an addition to our plant, and expanding our present specialized line to the manufacture of technical paints, varnishes and super colors, ground in oil. The addition is to be started immediately, and we expect to be in a position to manufacture by the first of December, or not later than the middle of December.

"We have become financially affiliated with a prominent Philadelphia paint manufacturer, who has been in the business for the past 30 years. Our plant in Trenton is being equipped with the necessary machinery and space to manufacture technical paints for the sign industry and the industrial trade.

"We feel that INDUSTRIAL FINISHING, together with some of the other industrial magazines in which we have been advertising for the past six months or so, has been greatly responsible for our growth.

"The products we have manufactured in the past, and which we are manufacturing now have proved their merit, as evidenced by the jobbers who handle our products, and the manufacturers who use them."

Design, Color, Finish, in

Wood Marquetry

By P. C. BARDIN

Methods which are employed at the Hoosier Veneer Co., Indianapolis, Ind.

REAL artistry is displayed in the manufacture of marquetry faces. Selection of the various species of wood is most important. In the finishing of furniture, the different woods are blended and an effort is made to uniform the color of the entire piece. But in marquetry faces, beautiful effects are produced by contrasted colors appropriately used to depict the particular design.

To accomplish this, both stained or dyed woods and veneers in their natural colors are used. When a particular design is received or originated in the art department, careful study is necessary to determine which species of natural veneers may be used to represent the various parts of the design. It is also

important to determine whether or not these veneers in their natural colors will harmonize with the stained veneers immediately adjoining, and with the design as a whole.

The field, which is the comparatively large expanse of wood surrounding the marquetry design, is nearly always made up of veneers in their natural color. Hence it may be seen that the choice of stain colors must be based on the particular wood used in the field. Colors used in some of the more elaborate floral designs embrace a full range of all of the colors. All of these colors must be predetermined and the veneer stained before the various parts of the design are sawed out. This presents a far more difficult problem than would exist if the different parts of the design could be sawed out and then stained. Of course, this is impossible, due to the swelling and subsequent shrinking of the veneer when it is subjected to the stain and then dried.

It is possible to use any light colored species of wood such as white holly, maple and magnolia. White holly is used for the highest grade work because this species of wood is very close grained (dense) and is particularly free of any grain figure. Maple, and even white ash with exceptionally wavy figure, is sometimes stained to represent water. In fact the proper selection of the species of wood both for stain and for natural use must be performed by an experienced artist in wood, for he must visualize the effects of color, figure and texture long before the marquetry picture is composed.

Stains or dyes are made up, thoroughly dissolved and strained into vats. Pieces of veneer are placed in the different vats which are then covered to prevent dust from settling in the stain, to retard evaporation and to keep out the natural light. Stains are agitated several times daily. Veneers remain in the vats until the stain penetrates the entire thickness of the veneer. The length of time required to accomplish this varies with the density and texture of the veneer.

After the stain has thoroughly penetrated the veneers, they are removed from the vats and dried between heated boards to a moisture content of about 8%. This leaves the wood in a flat, but soft and pliable condition which promotes ease of handling and retards breakage in sawing.

Next the various parts of the design are sawed out. At this point the problem of shading both natural and stained veneers presents itself. This is a very delicate operation and here again great care must be used in the actual work and an even greater vision obtained of the completed design. Shading is done by scorching the veneer by subjecting it to varying degrees of heat to produce the desired effects—sometimes done by dipping it in hot sand.

That you may obtain a vivid picture of the possibilities of combining natural and stained veneers in marquetry designs, I have selected "The King Of Clubs" design shown at the beginning of this article.

The field is American stump walnut; background is natural white holly; the club is in white holly stained black; the hat is in natural satinwood, shaded; upper plume in white holly stained orange; lower plume in natural padouk, shaded; the hat band in natural lemonwood, shaded; hair,

beard and eyebrows in natural American walnut, shaded; face in natural German pearwood, with the shaded portions on side face, nose and around the eyes, stained light yellow; pupils of eyes and nostrils in white holly stained black; iris of the eyes in natural padouk, shaded; whites of eyes in natural white holly; chest is in natural ayous, shaded; collar in white holly stained canary yellow; breastplate in natural padouk; tunic in natural Madagascar rosewood, and the coat in natural mahogany.

The fine lines in the face, plumes and beard are saw cuts filled with a mixture of stained sawdust and glue. The sawdust is sifted to prevent any large particles of wood from entering the work.

After all the parts for the entire design have been sawed out in the respective woods, a piece of newspaper is placed on the table and, with a dab of glue at a time, the parts of the design are fitted together.

When the entire design is completed on newspaper, a craft paper of comparatively heavy weight is glued to the face of the design, and the pieces are put under pressure for about 30 minutes. Then the newspaper is sponged with clear water and removed, after which the faces are again placed under pressure for 12 hours.

Upon removal from the press, the faces are completed. The craft paper remains on the face side of the veneer. When these marquetry faces are laid up in the gluing operation, the exposed surface is placed next the crossbanding, leaving the craft paper on the outside. In sanding the plywood, the craft paper is removed, exposing the marquetry.

Obviously in dyed woods, the dye must uniformly penetrate the entire thickness of the veneer, for in the event that the center of the veneer is not the same color as the outer areas, in sanding, the color effect would be changed, often spoiling the face.

Two species of wood—white holly and maple—are used chiefly when it is necessary or desirable to employ dyed woods. White holly is a very close-grained wood, with no appreciable grain figure; it absorbs the various dyes admirably.

This collection of rare natural woods properly combined with stained veneers produces a very pleasing effect and will give you an idea of the possibilities of marquetry designs for better furniture.

Naturally the finishing coats used on this artistic, colorful, wood marquetry must be clear—clear shellac or undercoater and clear varnish or lacquer.

Reports on Industrial Business

Mr. Paul Sommer, president, of the North Bergen Varnish Corp. has just returned from an extended trip from Pennsylvania, Maryland and West Virginia, where he called on many large industrial plants. He states that while business is still spotty in certain lines, manufacturers in general seem to be quite hopeful, many reporting steady gains in business over the first half of the year.

Paasche's Automotive Line

The Paasche Airbrush Co., of Chicago has recently placed on the market a complete line of automotive air-painting, air-finishing and air-oiling equipment. One of the most popular of these units is the type UHT striper, used by many of the leading automobile manufacturers in striping and trimming body, wheels, and fenders.

An automotive catalog covering this complete line has recently been released and may be secured by writing the Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, Ill.

Refinishing Fokker Aircraft

By G. L. HARDY

Fourth article in a series* describing the material and routine specifications included in cleaning, conditioning and finishing the metal, plywood and fabric surfaces of modern aircraft in service for Western Air Express and subsidiary air lines.

IN CONNECTION with the wing finish, the nacelles come into consideration. If they are to be the same color as the underside of the wing, there is nothing to cover up; but if they are of a different color, they should be sprayed first and covered, as it is far easier this way than to spray last and mask that immediate portion of the wing.

Spray the nacelle tubing if the motor is removed, or brush in by hand close to the motor, and spray the parts farthest away if the motor is in the frame.

If men are working all around you on the ship, it will be advisable to spray the underside first and get out of their way as soon as possible. This also gives you a chance to put on the identification numbers while the top side first-coats are drying.

An aluminum finish calls for careful selection of bronze powder—one that is of fine enough mesh to do away with any sanding or use of steel wool. This may run the cost of bronze powder up well over the dollar mark per pound in keg lots, but elimination of useless steel-wooling or light sanding operations and the labor saved offsets the extra cost of material to the extent that it is of only minor consideration.

Should the top color be different from the bottom color, snap your chalk line at the proper division on the leading edge and paper off at least a foot wide. Let this apron hang straight down in preference to taping under; then the spray dust will fall straight down, following the hang of the paper, whereas if it is taped under, the dust has a tendency to follow in under and lodge on the finished surface of the underside.

A 2-in. paper masking tape on the trailing edge, hung in the same manner, should be sufficient.

The top color should be applied the same as on the fuselage—mixing the clear in the last two coats. Three coats of ordinary colors on the top side is enough, because the flat surface allows it to be flowed on much heavier and wetter.

Handle the ailerons of the old square-edged type with particular care. They really should be stood up on the flat edge between coats to avoid warping. They are of sufficient length to be supported by three horses of equal height.

* Previous articles on this subject appeared in December 1930, January, and April 1931.

The late model Freise type ailerons must be handled flat, due to their shape, and here three horses are just as essential.

If any part of the finish is to be silver, it may be run through with the finish coats of the tail surfaces.

Three men should handle the top, and all of them should wear tennis shoes or work in their stocking feet, so as to avoid any chances of slipping and scarring the finish. Care should be used in cleaning the soles of the shoes from all dirt and grease to avoid tracking it on the wing.

Dust off carefully before spraying. Two men should work on top of the wing, spraying as far in front of the leading spar as is possible and back to the rear spar. The second man should watch the hose, keep paint in the gun, and dust ahead as the spraying progresses, so as to avoid an unsightly rough finish.

The third man takes up the finishing from the rear spar to the trailing edge and also the extreme leading edge down to the masked-off part; he can easily do this and at the same time keep ahead of the men on the top side. A third man may seem useless, but the work will run proportionately and surprisingly lower than can be readily imagined, especially if bronze powder is being applied.

Move along carefully from cap strip to cap strip where the cross strips cross each other. Resting the weight of the body or stepping carelessly paves the way for the undercoats to pull loose and results in the ultimate ruin of various panels of the finished surface.

After applying the finish coat on the wing, if the surface appears to have a little spray dust collected here and there, you may wait until this dries and then wipe it off carefully, or you may take straight retarder and fog a coat over the entire wing surface, using the cone spray to reach the farthest panels, and fanning it on the closer panels. This may all be done from ladders without getting back on the wing or on the overhead cat walk, if you possess one. This will give additional luster, and two men can accomplish it in less than one half hour total time.

The identification numbers are usually best brushed in by hand in lacquer. Although masking for spraying is more costly at first, it is usually cheaper in the end. For this handwork we have a system of heavy pressed board patterns properly spaced to suit specifications. These are laid out on the wing faster than a gummed back stencil, or a free hand sketch layout, and they make all ship numbers absolutely uniform.

Lacquer of the combination brush and spray type is the best. Be sure to select one that is not over-balanced with gums that would wrinkle up under future touch.

A large letter ensignia as our "WAE" on the underside of the right wing is best laid out in uniform measurements and masked off with paper and sprayed. A pattern of this type is too huge and clumsy to bother with a stencil on the underside of a wing of this proportion.

Exterior Mouldings

New mouldings may be brought along with the same finishing methods as the wing. Old mouldings may be carefully masked off from the rest of the ship and carefully stripped with acetone. Pull off these papers and replace with new, as some of acetone may have leaked through to the fabric finish.

Never try to fill a checked surface with lacquer, as the solvents of the freshly-applied lacquer will start the old coats underneath working, and soon you will have as unsightly an alligatored surface as it is possible to produce.

Enameling

This subject has been purposely left out, as the oldtimer needs little or no suggestions on this, and the beginner will fare better to choose an "old reliable house" and have their service man set the schedule.

I might say though, that the use of oil oxide primers on cylinders is a needless precaution, as they always call for extra coats to show real depth and finish, and this means an excessive increase in heat radiation on the barrels—which is what all motor companies are trying to avoid. However, oil oxide on amphibian engines should prove more satisfactory.

We use an old reliable brand that gives perfect satisfaction in two coats. Three coats were at first necessary until the right mesh in sandblast abrasive grits was found.

Care will have to be exercised as to the number of coats used on motors that have not been enameled before in your shop, as they may have been sandblasted deep and coarse before at some other place. A careful check after the second coat will determine whether or not the pitted metal is thoroughly protected.

Fan shell sand is exceptionally good, or an equal mixture of Wisconsin sand and No. 60 or 80 steel grit is very satisfactory. The use of straight sand will possibly prove the safest, as any cracks in the barrels will show up best on a sandblasted surface.

Some barrels blue slightly at 450°F., so do not select an enamel that requires such a high heat or an extra long bake.

(To be concluded)

Hilo Varnish Moves

Hilo Varnish Corp. announces the removal of its factory and offices to its new modern plant at 42-60 Stewart Ave., Brooklyn, N. Y. (One block from Jefferson St. Station on 14th St. Subway). Telephone Williamsburg 5-1300.

Colors Popular for Automobiles

Black, as a finish for cars, is losing its popularity in favor of blue, according to the October issue of the "Automobile Color Index," (published monthly by the Duco Color Advisory Service, Detroit). In the choice of blue by car buyers, preference is shown for more cheerful color. This tendency away from sombre hues is in striking contrast to color preference in France and on the Continent in general as indicated by the preponderance of black cars now on view at the Paris Automobile Salon.

"Blue," says the Automobile Color Index, "is rapidly climbing back into prominence as an automobile finish, while black keeps on declining. Blue's decided spurt since last month has resulted in the highest index recorded for this color family since July, 1930. An analysis of the various blues of current importance shows considerable consumer interest still extant in blues of reddish hue and high saturation.

"Bright, medium town car blue has been superseded by dark, bright templar—a blue distinguished by a rich greenish undertone. A clear, bright blue, somewhat lighter in value than templar and known as commander blue, has also gained prominence."

The Index further points out that green's advancing trend has been terminated by an abrupt decline, while brown continues the major decline which began a year ago. Maroon also is declining rapidly, but grey is once again on the upgrade, after many months of listless drifting.

"The appearance of a car today has much greater value as a sales factor than ever before," the Index notes. "As a result of this situation, every conceivable color variation that could be made practical for automotive purposes is being brought into play for 1932."

Crystallizing Lacquer

Finishes for Wood

By B. SANDERSON

WITHIN RECENT months a new novelty finish for wood has been developed to a practical stage and offers attractive possibilities to the finisher who is interested in producing a finish that is different.

Crystallizing lacquers, correctly formulated and properly applied, offer almost endless possibilities for individually attractive finishes. The fact that the lacquer almost never crystallizes in exactly the same pattern, makes it possible to secure crystal patterns that are always new and interesting. Also the fact that it is possible to obtain a great many polychrome effects by wiping, shading and blending, offers possibilities for attractive finishes that are only limited by the ingenuity of the finisher.

To Produce Crystal Effect

Briefly, the polychrome crystal finish on wood is brought about in the following manner. The surface of the wood is first sealed with a lacquer sealer especially formulated for this purpose. The crystallizing lacquer is sprayed over the sealer and when the crystals have formed and the lacquer has dried, colors in japan are wiped over the crystal formation; after the japan colors have dried, the finish is built up with the usual lacquer top coats. The final finish may be rubbed or polished if desired.

Selection of Materials

Unless the finisher chooses materials of proved dependability, he is apt to be very much disappointed in the results that he will obtain. When crystallizing lacquers were first developed, they were limited to use over dense, smooth surfaces such as metal or glass, and they were very erratic in their performance, depending for satisfactory results upon weather conditions, temperature and humidity. However, at the present time, crystallizing lacquers are available which give satisfactory results in production finishing under any normal condition.

It must be remembered that all types of crystallizing lacquers do not produce the same effects. Some merely produce a maze of radiating lines, whereas others produce almost solid covered areas of feathery patterns. In order to avoid monotony of form, which was one reason crackle lacquer lost its popularity so quickly, it is necessary to select a crystallizing lac-

quer that breaks in varied forms.

I have seen crystallizing lacquers that could be depended upon to produce many diverse beautiful effects including needle-like patterns, feathery areas, curling lines and geometric areas. At times some of the most interesting crystallizing lacquers will produce forms strikingly resembling flowers, ferns and futuristic patterns.

In the past, the only novelty finish applicable to wood that received any wide-spread usage, was crackle lacquer. When crackle lacquer was introduced to the finishing trade, it offered many attractive possibilities and did provide a finish that was distinctly new. However, the fact that the pattern in which crackle lacquer broke was in all cases very similar and lacking in individuality the popularity of this finish quickly diminished, due to the fact that once the original novelty of this finish wore off, it lost its appeal because the effect could not practically be varied to keep up interest.

The sealer must be specially formulated for use under crystallizing lacquer, as ordinary lacquer sealers are not suited for this purpose. In spraying the sealer, the gun should be cleaned after application with acetone or whatever special solvent the manufacturer of the lacquer recommends. Ordinary lacquer solvent should not be used for this purpose.

The crystallizing lacquer should have a good body so as to enable it to stand out on the surface of the wood. Most crystallizing lacquers will carry an odor of naphthalene, (moth balls) and in some instances camphor. These are "clean" odors and once a spray operator becomes accustomed to them, they will not cause any production difficulty. However, some crystallizing lacquers on the market contain certain chemicals added because of their effect on the crystallization which have a very nauseating odor. Such lacquers should be avoided if possible because of their effect on the spray operators.

Perhaps the best way to test a crystallizing lacquer is to prepare a number of panels with the sealer, and finish them under different conditions with the crystallizing lacquer. (Before making a test such as this, it would be well for the spray hand to practice applying the crystallizing lacquer until he is able to put a fairly uniform coat on each panel).

In making the test, it would be well to finish one panel on a hot day if possible, finish another early in the morning, a third with the windows open but not exposing it to a direct draft, a fourth in a vertical position, and the fifth in a horizontal position. The crystal effect on all of these panels should be practically the same, i.e., the type and general characteristic of the crystal formation should be of such a nature that the panels will all harmonize with each other. This is the most severe test that can be applied to a crystallizing lacquer and a lacquer which successfully passes it [the test] may be relied upon to give good results in actual production.

Applying Crystallizing Lacquer

Crystallizing lacquer should be sprayed at a comparatively low pressure, the pressure on the gun being kept below 40-lbs. at all times. This will make it easier

to get a uniform film on the work and will also prevent excessive evaporation of the solvent before it hits the work. The most important feature connected with the application of crystallizing lacquer is to see that a film of uniform thickness is applied at all times.

The crystallizing lacquer should be allowed to *air dry*, and no attempt should be made to force dry the finish. Under normal conditions, the crystallization will be complete at the end of from 30 to 40 minutes. However, it is advisable to allow the crystallizing lacquer to dry over night before proceeding with the finish.

In certain cases, the results are improved by allowing the crystallizing lacquer to dry in a confined space. For instance a certain casket manufacturer gets the most satisfactory results by spraying the casket and then putting it into a wooden box and allowing it to remain over night. The same idea may be carried out by putting the sprayed articles into a cabinet or poorly ventilated oven (without heat). However, it will usually be found that such precautions are unnecessary if perfectly formulated crystallizing lacquer is employed.

Suggested Effects

The general finishing schedule which was given earlier in this article may be varied to produce a great many effects. The following are a few suggestions: The wood may be stained to any desired color before applying the sealer. It is also possible to incorporate certain types of stain in the sealer coat. It is possible to employ colored lining bronzes in the sealer coat, or to apply a coat of the sealer and follow it with a coat of sealer containing bronze powder.

Novelty finishes on wood provide a sales appeal that is proportionate to the newness of the finish and the beauty or attractiveness of the effect. A novelty finish tastefully executed may often be the deciding factor in determining the successful sale of an article.

By utilizing the natural color of the wood and the methods just mentioned for securing a colored background, many beautiful effects may be obtained.

After the crystallizing lacquer has dried and colors in japan are to be wiped on, the artistic ability of the finisher will suggest many attractive color harmonies. It is also possible to wipe dry bronze powders over the crystal formation. In this case it is not necessary to employ the japan colors, although they may be used in conjunction with the bronzes if desired.

After the japan colors are dry they may be shaded with lacquer enamel which has been reduced to cut its covering. The final finishing coats may be either lacquer or varnish.

By masking the work, it is possible to obtain imitation inlays, borders, etc., with the crystallizing lacquer.

DeVilbiss Spray-Painting Book

A new catalog giving descriptions and prices of DeVilbiss portable spray-painting outfits has recently been published by The DeVilbiss Co., Toledo, Ohio, manufacturers of spray-painting and spray-finishing equipment. This catalog contains information which should be of value to every user of spray-painting and decorating equipment. It is complete, concise and is easily understood. This catalog, known as the PC, will be sent free upon request to The DeVilbiss Co.

Recent Development in the Coloring of Lacquers and Varnishes

By SAMUEL S. HARKAVY

Recently I had the pleasure of conferring with one of our Swiss chemists on the coloring of lacquers and varnishes. Through his kindness I was able to obtain the information which I am placing in my article "Recent Development in the Coloring of Lacquers and Varnishes." He described to me the usage of Grasols and Frobenos on the continent and of their gradual usage in this country. I was able to find that the users of these colors in the United States comprise a number of our largest manufacturers.

I believe this article will prove of interest to all of the lacquer and varnish manufacturers who read INDUSTRIAL FINISHING.

Upon request, I shall be glad to furnish any readers samples and a detailed description covering said colors.—

Samuel S. Harkavy

RADICAL changes in the finishing industries during the past years, new raw materials and new technical research are responsible for the improved practical results. At no time in the history of the lacquer and varnish industry has the viewpoint of the practical and laboratory technician been considered in common as in this present period. Through this co-operation, the industry has been able to make extensive improved changes in the material formulation of lacquers and varnishes in the speed of drying, durability and particularly in the quality of color.

Basic (alcohol soluble) and oil (benzol soluble) were the colors in common use in coloring of transparent lacquers and varnishes until the recent European development of colors termed "Grasols." These colors have enjoyed wide usage on the continent and are now finding many users in this country.

What are the Grasols? The Grasols may be designated as oil soluble. They differ from the ordinary oil color in that they have no stearate base. While basic colors are only soluble in alcohol and oil colors in oils, the Grasols have the peculiarity of being soluble in alcohol, benzol, turpentine, linseed oil, acetone and butyl acetate. They may be dissolved directly in lacquer or varnish without previous dilution in the thinner solvent. This allows the user to obtain unlimited color strength.

Now let us take the outstanding colors of this group and tabulate

Solubility in	Alcohol	Turpentine	Linseed Oil	Benzol	Acetone	Butyl Acetate
Temperature in centigrade	70°	70°	70°	70°	35°	60°
	%*	%	%	%	%	%
Grasol Yellow, 2R	40	8	20	20	40	40
Grasol Orange, 2R	6	7	10	5	15	15
Grasol Scarlet, G	3.5	5	5	5	10	10
Grasol Red, BN	2.5	4	1.5	4	10	10
Grasol Violet, B	2.5	3.5	1.5	3	5	5
Grasol Pink, 3B	5	0.1	2.5	5	3	5
Grasol Blue, RS	5	5	10	5	5	4
Grasol Black, BS	1	0	0	0	5	0

*Parts soluble in 100 parts of solvent.

their respective characteristics and relative solubilities, see the accompanying table.

As noted from the table, Grasol Black BS is not soluble in turpentine, linseed oil, benzol and butyl acetate. A black for this purpose can be readily obtained by mixing Grasol yellow, blue and violet.

In conclusion, the author wishes to state that with the Grasols, one may obtain the brightness of the basic dyes and the fastness of the oil colors, and still maintain color economy. Without doubt the Grasols are the latest improved development in the coloring of transparent lacquers and varnishes.

Forecasts Varnish Durability

Research paper No. 333 published as a 12-page booklet by the Bureau of Standards of the U. S. Department of Commerce explains in detail a new test for predicting the durability of varnishes (the photochemical embrittling test). This booklet is for sale by the Superintendent of Documents, Washington, D.C. Price 5 cents.

Schwenk Safety Device Corp., Moves

Schwenk Safety Device Corp., manufacturers of safety handling equipment and carboys has moved from 70 E. 45th St., to 27 Water St., New York City. Telephone: Whitehall 4-9324.

"Emulsions—How to Use Them"

The above is the title of a booklet just issued by the Glyco Products Co. Inc. Bush Terminal Bldg. No. 5, Brooklyn, N. Y. This booklet contains a number of formulas for making emulsions of oils, fats, waxes and solvents. Actual working formulas are given for making commercial polishes embodying the latest chemical developments. The formulas for furniture and automobile polishes are noteworthy because they are applied very easily and give an extremely high polish which will not show finger-prints. Formulas for a liquid floor wax and metal polish are also included.

ONE must look further than the life of an organization:—measured in terms of years—for the intrinsic excellence of its product.

No company is greater than its personnel, and the personnel of THE ZAPON COMPANY—long in our service—gives our customers a sense of confidence in the perfection and soundness of our merchandise.

"The Acknowledged Standard of Quality Since 1884"

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THE ZAPON COMPANY

A Division of Atlas Powder Company

STAMFORD CONNECTICUT

By E. PERRY

Painting and Finishing

Railway Rolling Stock

WHERE METAL is used on the interior of a passenger car it would seem to be absolutely necessary to give the surface a light sandblasting in order to provide a tooth for the primer to adhere to. This would go a long way in warding off peeling of the finish so liable to occur on a smooth surface. The subject of sandblasting seems to have created quite a lot of interest during recent years, particularly pertaining to the sandblasting of exteriors of steel cars.

One outstanding question has been: What advantage is obtained (considering the expense of constructing a suitable building) from doing this work in a regular building, or would it not be better from the standpoint of health if this work was done under an open shed? Furthermore, another question has been, whether sharp sand or steel grit is preferable, considering efficiency and health.

Following is a description of two different methods of abrasive blasting steel cars; one is done out in the open shed and using sand; the other is done inside of a specially constructed building, and steel grit is used instead of sand.

Using Hard Flint Sand

In employing the first method one railroad company uses a hard flint sand. With their apparatus it requires about 1½ tons of sand, and seven hours by an operator and his helper to sand one standard steel car of about 1200-sq. ft. of surface. Of course this is under ordinary conditions; practice has proved that all surfaces do not sand alike, and neither will all operators work alike. The foreman painter here computes a cost of a little over 3½ cents per square foot for labor, material, and upkeep of the sandblasting machine; but this cost does not include preparing the car for the sandblast, nor cleaning out after completing the sandblasting.

In the case just mentioned the foreman painter considers his sanding outfit ideal for a small shop, and it can be installed at very small cost. His sand house is 90-ft. long, 15-ft. wide, and about 25-ft. high. It is a wooden frame structure with a gable roof and lined inside with sheet metal up 15-ft. from the floor which is concreted. A metal scaffold on each side may be lowered or raised at the convenience of the operator.

This building has a 6-ft. open space at the top to allow the dust to escape. There is a sand machine on each side of the car to be blasted, with capacity of ½-ton of sand. These machines are kept near the center of the building, so as to avoid moving them around, and in this way they are able to sand the entire car without shift-

Will your product LOOK like 1932? ★ ★

Photograph Courtesy Autogiro Company of America

NEW MODELS! Improvements! *Reasons* to buy far more effective than price-cuts, to put your product at the front of returning prosperity!

You have these? Then let buyers *see* the difference! Vividly. With smart new colors. With richer lustres. With *better finishes!*

The quick eye-appeal sells ten times as fast—even to hard-boiled buyers—as cold reasoned arguments. And the *ultimate* buyer, the public, eats up the eye-satisfaction of a fine finish.

Egyptian Lacquers offer you the help of men who know finishes not only from the technical side, but also as *selling tools.*

Call in the Egyptian representative. He's in the phone book of the cities listed below. In many cases your new finish will prove not only *better* than the old, but *cheaper.*

THE EGYPTIAN LACQUER MFG. CO.

90 West Street • New York City

Branches in charge of practical men maintained in:

Atlanta	Chicago	Dallas	Kansas City	Portland, Ore.	Spokane
Boston	Cincinnati	Denver	Los Angeles	San Francisco	St. Louis
Buffalo	Cleveland	Detroit	Philadelphia	Seattle	

ing. They have found that to get best results it is necessary to maintain a pressure of not less than 90-lbs. of air at the sand machine. To do this requires pressure tanks sufficiently large to hold that pressure while sanding.

In this particular shop the air compressor is about ¼-mile from the sand house. There is a 2-in. air line leading from the compressor to the sand house. At each end of the sand house are storage tanks (eight in all) 5-ft. long and 2-ft. in diameter, so equipped that the water can be drained from the tanks before it reaches the sand, as it is very important to keep the sand dry. They use regular sandblasting hose with a 10-in. length off ½-in. pipe inserted in the end.

The second method is reported on by a railroad foreman painter who believes there is a distinct advantage in doing this work in a special building provided for this purpose. His company's fine new building, which with a complete outfit of the necessary equipment cost about $65,000, is 102-ft. long and the width inside of the main blast room is over 20-ft. It has outside hallways on each side of the building, and these are filled neath. Everything is electrically operated, and if necessary six men could be used on blasting at one time.

No. 50 steel grit is used for blasting. This grade has sharp angles, therefore it cuts rapidly and easily; it does not mash nor crumble like sand, so practically all dust is avoided although workmen should be compelled to use a hood over their heads to prevent steel grit getting into their eyes. Besides being a labor-saver steel grit does cleaner work, especially on old metal surfaces.

As to the difference in the cost of using steel against sand, a comparison is given in the accompanying table. The railroad company had formerly used sand out-of-doors with portable machines. To sandblast a 70-ft. passenger car which had been painted several times, the cost per car for labor and material had been $35.92, using sand, as against $20.99, using steel grit.

The foreman painter says he has never used sand in the new building. From the standpoint of health he believes that sand would be quite different from steel grit, probably more hazardous. He further stated that their new building protects the car or locomotive from all dampness, even during bad weather.

2880-lbs. of sand (@ $3.50 per ton)	$ 5.04
Freight for same (@ 60c per ton)	.86
Cost of air used (compressed air)	11.59
Labor—operator and helper	18.43
Total cost, using sand	$35.92
143-lbs. of grit (@ $90 per ton)	$ 6.43
Freight for same (@ $2.40 per ton)	.17
Electric current 8-hrs	3.80
Cost of air used (compressed air)	4.89
Labor for blasting and blowing out	5.70
Total cost, using steel grit	$20.99

automatically with steel grit which falls into the pit in the main blast room during blasting. On the outside is an overhead fanhouse where all the dirt and dust is carried out from the blast house and is loaded into cars under-

The rapid development in the use of lacquers by the automotive industry was followed about eight

What you pay for and what you get are two different things

These stain panels are your guide to the facts

Saving real money is of interest to everyone—now and any other time. If on top of that you get a *better* job—then you've *got* to listen and to act.

Here are the facts. To your left are four panels of glazed cardboard. One drop of the three types of stain was dropped on each of the panels and one drop of Murphy Permanent Stain was dropped on a fourth.

Study the result. Note the spread, illustrating the relative penetrating power of each. Note the staining efficiency—the dark areas show where the color has precipitated out in the dry state, color you pay for but don't use. Every molecule of Murphy Permanent Stain is distributed to the wood in highly "liquid" form, before it can precipitate. The saving over water stain is very high in this important particular. Note also the "bleeding" of the oil and spirit stains and the fastness of the water and Permanent Stains.

Murphy Permanent Stain does not raise the grain—eliminates sanding operation—hence money saved. Because it dries to take filler in an hour or less, work goes through smoothly saving considerable floor space. Production increased—more money saved.

These are just a few of the important characteristics of this wonderful product.

Murphy Permanent Stain has saved thousands of dollars for hundreds of concerns. It can do the same for you.

(Murphy Permanent Stain is licensed by the Chadeloid Chemical Company)

MURPHY VARNISH COMPANY
Newark Chicago San Francisco
ESSEX VARNISH COMPANY (Associate Co.) NEWARK
Baking Material Specialists

Murphy Permanent Stain

years ago by a conscientious effort on the part of a number of lacquer manufacturers to adapt their products for application in the railway car equipment field. The initial experiments undertaken by them, both in the car building and railway repair shops, were not wholly successful, but the progressive shop painters soon found time to ponder over the addition of the spray-gun method for applying lacquer and paints. The conservative master car painters saw many new problems opening up, and the management magnified the property and personal hazards involved because of a number of disastrous fires.

This reluctance on the part of the railroads to accept a new product not yet developed to their own requirements kept the demand for spray work at a minimum, and those early experimental days likewise reflected an unwillingness on the part of the management to assume risks to their plant equipment. Therefore, in the first stages, the passenger car exteriors were lacquered out in the open air, with only an adjacent side wall protection to stem the elements of weather. Obviously, the opportunity and ability to spray was directly dependant upon weather and climatic conditions.

As the demand for spraying became more than spasmodic, operations were attempted in some old shop remote from the main car plant, following closely the advice of fire underwriters in the segregating of spray work from all other crafts. The inaccesibility of the building usually appropriated for this purpose, with its attendant increased time demand upon shop supervisory forces, and the long hauls required for both material and men made this an expensive proposition.

The spray gun, however, had definitely proved its value as a legitimate and quicker substitute for the brush on operations where large areas were to be covered. As a result, master painters were convinced that regardless of the failure or success of lacquer as a car finishing material, spray operation could be readily adapted into the majority of large paint jobs. The experience gained from experimental lacquering soon proved useful to the paint mechanics who became equally proficient in the spray application of paint-type materials. Air pressure forced the materials into hitherto inaccessible corners, and skillful manipulation by experienced handlers of the spray gun created a smoother finished film texture. These well-defined advantages in beautifying the appearance of the passenger cars far outweighed the few objections of the conservative brush painter, and so the spray method was soon adopted as a progressive step in interior car finishing work.

As the success of paint spraying developed, the railroads next tackled the proposition of overcoming the hazards previously mentioned. The Pullman Car Mfg. Co. was particularly aggressive in endeavoring to promote the spray system entirely for all general finishing work. A large open shop isolated from other crafts was provided for the spraying of interior coats. In cold weather the exhaust of vapors was handled by large portable fans set at the ends of the car. In warm weather the shop doors were thrown open to better increase the air circulation.

(To be continued)

"In solving its problems, industry has found that research pays."

ABSOLUTELY NEW FINISH!

TURKEY WALNUT

THE LATEST DEVELOPMENT
IN PENETRATING STAINS

"SPRUANCE QUALITY"

551 Penetrating Stain

This Stain produces the beautiful amber tone of oriental Turkey Walnut when used on well-matched Walunt veneer and filled over with "Spruance Quality" 2843 Walnut Filler

This Stain does not raise the grain of the wood. Does not bleed under lacquer or sealer. Does not wipe up under filler. Produces a clear, transparent color similar to an Acid Stain without wash-coating or sanding.

SPRUANCE QUALITY
Finishing Products

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OFFICES : : WORKS : : LABORATORIES

RICHMOND AND TIOGA STREETS
PHILADELPHIA

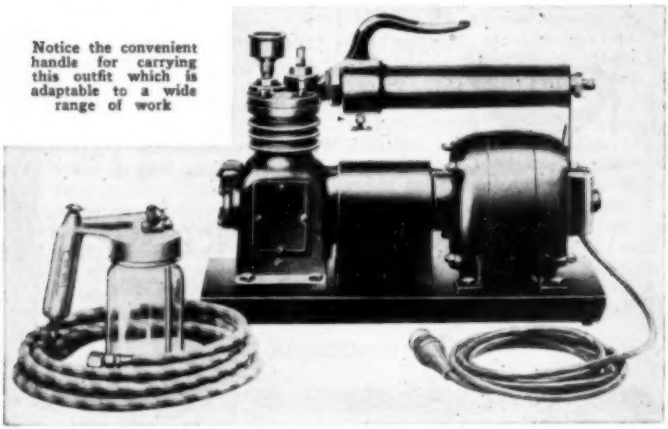
New Materials and Equipment

Portable Spray Outfit

An improved small portable spray-painting outfit, easily operated and carried by one person, has recently been announced by The DeVilbiss Co., Toledo, Ohio, manufacturer of spray-painting and spray-finishing equipment.

This low priced outfit, known as the DeVilbiss NC-607 is a dependable unit of great adaptability and is recommended for use by master painters, decorators, contractors, builders and others as supplemental equipment for touch-up work on small sized painting or refinishing jobs.

This outfit is electrically driven and operates economically on any light socket. The compressor and motor are compactly and securely mounted on a rubber-footed metal base.



Notice the convenient handle for carrying this outfit which is adaptable to a wide range of work

New "Rubless" Polishes

The Glyco Products Co. Inc., Bush Terminal Bldg. No. 5, announces the production of a paste form of "rubless" polish, containing a minimum water content. This paste is dispersed in one or more parts of water to give a fluid non-separating emulsion. This emulsion, being composed of carnauba wax and hard resins, makes a durable, water-repellent polish.

NEW OIL AND WATER EXTRACTORS *by BINKS*

No. 38

No. 39

If oil and water laden air has interfered with your spray finishing production, these new extractors, Binks' latest contribution to the art, will end your troubles. The entirely new and unusual filtration system and baffle arrangement removes every trace of foreign matter and delivers pure clean air to the spray gun. A trial will prove quickly their extraordinary efficiency.

New "THOR" SPRAY GUN

This new Binks "THOR" Model 2, which gives a round, oval or flat spray without changing or adjusting nozzles, is being acclaimed by spray finishing executives as the perfect spray gun the world has been waiting for. The adjustment is effected by turning a small thumb screw at the back of the gun, and in less time than it takes to tell about it.

Our complete general catalog gives all the details concerning these new products as well as hundreds of other items in the complete Binks Line. Write for a copy, today.

BINKS MANUFACTURING CO.

3001 Carroll Avenue, Chicago

Branch Offices and Representatives in 16 Principal Cities

Makers of Everything in Spray Finishing Equipment

These polishes are mopped, sprayed or flowed on articles of leather, rubber, linoleum, hair, wood, paper, cement, plaster-of-paris, terrazzo, etc. Dries glossy; no rubbing is necessary. If, however, a higher gloss is desired, light rubbing may be resorted to.

These polishes are non-inflammable, practically odorless, highly penetrating and economical in cost and application. They are of interest in preventing dusting and chipping of cement floors and walls and for evening out rough spots in "rubbing" down cement, cork, and other heat-insulating surfaces.

On textile materials, felt, fur, hair and paper, these polishes act as a sizing and in some cases (because of their high penetrating powers) require slight "buffing."

Alcohol Proof, Heat Proof Lacquer

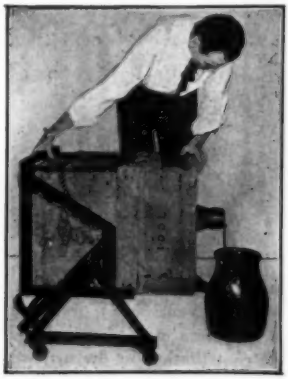
The Utley Products Sales Co., 318 W. Randolph St., Chicago, Ill., announces a new Utway lacquer which produces a finish that is said to be 100% alcohol proof and also proof against damage by boiling water or hot dishes. According to the manufacturer one of the typical tests imposed upon a panel finished with this was as follows:

A metal container filled with water was placed directly into a gas flame and allowed to remain until the water boiled over, and the temperature of the metal container was raised considerably above that of boiling water. The container was then removed and immediately placed directly on to a lacquer panel and allowed to remain until cold, without any effect whatsoever upon the lacquer film.

Carboy Cradle

The importance of using proper acid-handling equipment is attested by statistics on accidents. During a recent 12 months there were 219 serious acid injuries reported to the New York Industrial Commission.

An improved carboy tilter, designed to prevent such accidents and enable one man to safely truck, drain, and otherwise handle carboys of liquids, is announced

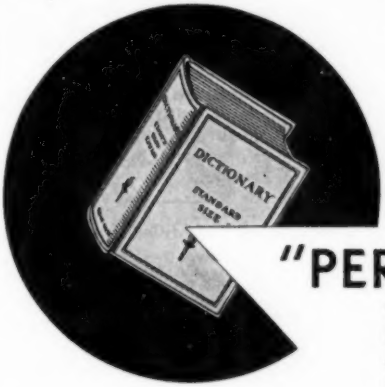


Approved by safety organizations

by Schwenk Safety Device Corp., 27 Water Street, New York, N. Y.

The new equipment is an improvement in that the carboy is elevated into the tilter by levers. The operator does not directly lift the carboy, which often weighs 200-lbs. or more. The cradle wherein the carboy box rests provides support on three sides and the bottom, so that there is no danger of the bottle dropping through the box even though the wood be in bad condition.

Full control in pouring is had at all times regardless of the amount



"PERFECT"

The Dictionary says:
PERFECT: Completely effective; satisfactory in every respect.

LINGERWETT REMOVER

is perfect. It does the work thoroughly and satisfactorily.

When a paint remover does exactly what it is supposed to do—

When it does it with the least effort—

When it does it in the minimum time—

It is *perfect*. Why not call it *perfect?*

Lingerwett Remover is just that—*perfect*. It removes paint, varnish, enamel, shellac, or lacquer from wood or metal surface in the quickest possible time; it does it thoroughly with least labor. Lingerwett reduces the covered surface to a soft, loose sludge that is easily wiped off.

Lingerwett is definitely better than any other remover.

The best painters and the most painters use it. Try Lingerwett in *your* work. Your dealer will pay your money back if *you, yourself,* don't like Lingerwett better than any other remover you ever tried.

THE WILSON-IMPERIAL CO.
Newark, N. J.

The Wilson-Imperial Company
115 Chestnut St., Newark, N. J.
Please send me a free trial can of Lingerwett Remover.

Name .....

Street .....

Town .....

I. F.-11-31

State .....

of the liquid in the carboy. Every drop of fluid can be drained from the bottle.

Automatic Tile Glazing Equipment

The Paasche Airbrush Co., 1921 Diversey Parkway, Chicago, Ill., has developed a machine that holds considerable interest for manufacturers of glazed brick and other glazed products. This is a continuous glazing device with wire-cable conveyor passing under fixed, automatic, glazing brushes with air regulators and independent universal sliding and revolving arm mountings which provide complete adjustability for anchoring guns in most suitable positions.

The wire-cable conveyor operates entirely by compressed air, although the unit may also be equipped with electric motor drive when desired. Water and oil separators with air regulators, protect fluid pressure tanks and air-guns against foreign matter, providing clean, dry and regulated air pressure essential for best results.

Four special automatic glazing air brushes with air regulators and independent universal sliding and revolving arm mountings provide complete adjustability for anchoring guns in most suitable positions for best coating results.

Double "clamptight cover" pressure tanks with air agitators keep material well stirred. When bottom tank is empty, the contents of upper tank with agitated material is discharged into the lower tank, permitting production to proceed uninterrupted.

A fully enclosed fireproof ventilating unit with collector hood picks up surplus material which is flushed out through bottom outlet of collector.

LACQUER SOLVENTS
COMMERCIAL SOLVENTS CORPORATION
PLANTS:
Terre Haute, Ind., and Peoria, Ill.

Meetings Scheduled Next Month

Annual Convention of the American Paint & Varnish Manufacturers Association will be held at the Drake Hotel, Chicago, Ill., December 2-3, 1931. Reuel W. Elton, secretary.

Reports Furniture Conditions

V. J. Dolan, of V. J. Dolan & Co., 1830 N. Laramie Ave., Chicago, has just returned from a motor trip through the Central and New England States where he visited numerous furniture manufacturers. He reports conditions showing continued improvement and a more optimistic attitude on the part of manufacturers.

Represents Day & Co. in Indiana

The territory of W. W. Bennett, who has been covering Northern Indiana for James B. Day & Co. of Chicago, has been extended to cover the entire state of Indiana.

Jas. R. Hartley of Jamestown Wood Finishing, Dies

James R. Hartley, president of the Jamestown Wood Finishing Co., Jamestown, N. Y., died on October 15 following an illness of several months. Mr. Hartley was 48 years of age.

Rust-Resisting Coating

The Superior Sheet Steel Co., Canton, Ohio, has published a booklet containing interesting information about "Galvannealed," a highly rust-resisting coating for sheet steel, that is adapted to receive paints, enamels and lacquers, which readily adhere to it without the necessity of acid, weathering, or other treatments to prepare the surface for finishing. This booklet is entitled "Convincing Evidence of Advancement," contains 36 pages 8½x11-in. in size, is illustrated, and attractively bound.

How S-W Kem finishes

were tested and proved before being put into the Sherwin-Williams line . . . .

The accelerated weather testing machine is a merciless judge of the durability of a finish. When a finish passes this test, it is sent to various parts of the country for further testing under all climatic conditions.

This metal panel collected Cuyahoga Valley smoke, rain, gasses and sun for *more than two years.* But a damp cloth disclosed that the film of dirt lay *entirely* on the *surface.* The panel was finished with Kem Enamel.

The industrial finishing of objects like handles is so highly specialized that the paint engineer duplicates the exact action of the dipping machine in testing Kem Finishes for this market.

Kem Finishes are made from chemically evolved, or *synthetic* gums. The characteristics of these gums are *controlled* to meet the specific requirements of the finish being made. The result is a better finish in a wide field of applications than heretofore obtainable, because one desirable quality is not sacrificed in order to obtain another. For example: repeated tests in our laboratories, in the field and in commercial use prove that Kem finishes combine *rapid drying* with unusual *toughness and elasticity, easy working qualities* with *greater covering capacity*—and give improved adhesion to wood or metal, higher permanent lustre and remarkable, hard, smooth film at *lower labor and material cost.*

WRITE FOR STORY OF KEM

The complete "Story of Kem Finishes" is essential if you wish to keep abreast of the latest developments in the finishing trade. It will be sent you, upon request, without charge or obligation. Write for it on your company letterhead. The Sherwin-Williams Company, Department 709, Cleveland, Ohio.

SHERWIN-WILLIAMS
INDUSTRIAL FINISHES

Questions and Answers

Bright Silver Finish

We understand there is now on the market a new silver finish that is applied like silver bronze but it has the appearance of silver leaf or chromium plate. It has a deep gloss and brilliancy. One place we saw it was in the Statler Hotel barber shop in Cleveland, but we were unable to get the necessary information about what materials are used or how the finish is applied.—R. M. W.

To my knowledge there is not now available on the market a silver finish that can be applied like silver bronze, but which has the appearance of silver leaf or chromium plate. The nearest approach to this type of finish that I know of would be secured by mixing the finest possible grade of bronze powder with a clear bronzing lacquer or a clear varnish bronzing liquid and then spraying the material onto the work in a manner similar to that ordinarily used for applying bronze powder solutions. Of course the finer the powder is divided, the more nearly will be the finished results approximating metal leaf, but I doubt if the powders can ever be obtained in a fine enough state of division to do more than roughly approximate this result.

Our company (name on request) has a wonderful product made of an extremely fine grade of bronze powder, this material is to be mixed at time of use, with a high grade bronzing liquid. This liquid floats up the bronze powder to the surface of the coat and the powders themselves being so finely divided, result in the finish having a very metallic luster. —J. M.

This must be a new finish that has not yet come to my attention; or if there is such a finish I have not seen nor heard about it. But there is a finish that looks like silver leaf, but it is called "smooth white gold finish". I think it is the nearest thing to a polished finish that can be sprayed on. —A. M. Medel.

Remove Varnish Checks

How can checks be removed from a varnished surface?—C.W.

If the varnish has not disintegrated, sand the surface with No. 4/0 garnet finishing paper (water-

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FROM A SERVICE ENGINEER'S

THE MYSTERY OF THE FINISHING MATERIAL

"We are using too much. Where is it going?" asked a furniture manufacturer. A du Pont service engineer answered the question as surely as Sherlock Holmes used to solve his mysteries.

"THERE you have the story," concluded the manufacturer. "We should not be using so much of this material. Where can it be going? We give up."

The du Pont service engineer stood up. "I think I'll take a look around and see what I can find. There is an answer all right."

He went into the finishing room and talked to the foreman. Together they carefully inspected every step in the application of the system. Finally, they came to the spray booths. A few minutes later the du Pont representative said, "I'll bet your answer is right here. Your spray man is over-spraying every piece."

They watched him spray the front of a table. When he reached the end of the piece, he did not cut off his gun. Nor did he start back immediately. For a few seconds he permitted the gun to shoot material out into the air.

"Hey, shut off your gun," ordered the finishing foreman. "Come here a minute. You are wasting too much of that stuff." At the suggestion of the foreman and the spray man, the du Pont service engineer demonstrated how to start right back across the piece. The result was a saving both in finishing materials and in spraying costs.

It is catching such things as this which has made du Pont service engineers so valuable to furniture manufacturers and finishing foremen. The first thought of these du Pont men is to serve

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REG. U. S. PAT. OFF.

NOTEBOOK—STORY NO. 9

you. And they can do this well, because of their practical experience and training in furniture finishing.

• • •

THE days of du Pont service engineers are spent in helping manufacturers produce new finishes and correct faults in the application of old finishes. They find ways to reduce finishing costs and add to the beauty of the finish.

A great deal of their work is showing furniture manufacturers how to gain more enduring beauty for their products by using a du Pont finish. There is a du Pont finish or finishing system for every type of furniture.

Through rigid control of raw materials and manufacturing processes and through pre-testing of every finish—du Pont can supply finishes of uniform high quality—capable of increasing the value of your products. Why not let us see if there is not a du Pont finish, that, because of its speed, economy, durability and beauty will meet your needs perfectly? This is the time to examine every possible way to make your production more efficient . . . less costly. Perhaps we can help you find that way.

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FINISHES

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ROBERT W. HUNT CO.
(Signed) G. B. Girault
Chief Chemist

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proof paper could be used if the surface needs cleaning) and clean up. If water is used with the paper, sponge off the surface and dry with chamois.

There are several materials on the market satisfactory for using as a flow coat to remove checks. These materials are known under various names, such as amalgamators, glazes and check removers. A brush amalgamator can be used effectively for removing checks. Either brush or spray a heavy coat over the checked varnish surface. All pieces should be laid in a horizontal position, if possible, to avoid the heavy coat running.

Allow the amalgamative surface to dry overnight, sand with No. 5/0 garnet finishing paper, and clean up the job. If the checks were too deep for one coat of the amalgamator, repeat the operation allowing 24 hours for drying.

In brushing, use a good grade of cabinet rubbing varnish or in the case of pianos, a piano polishing varnish, and flow on a heavy coat. Dry two days in a dustproof room and rub, when thoroughly dry, with pumice and oil for a satin finish (a dull-rubbed finish). Polish with water and rottenstone.

A lacquer finish can be sprayed over an amalgamated surface if preceded with a lacquer sealer that will not lift the finish. Rub to the desired finish when thoroughly dry.—L. V. C.

Walnut and Mahogany Glaze

An inquiry on page 44 in the October issue is well answered by J. K. Cooper. His objections to japan colors for glaze work should be recognized by H.F.R.&R.S., not only because of their quick drying and higher cost but also because japan colors are not adapted to the purpose for other important reasons.

A prime requisite in materials adaptable to first-class color glazing is specially selected colors from the standpoint of richness and transparency, lacking any tendency to cloud or lose their brilliancy. Colors ground in oil provide the full degree of beauty inherent in the dry pigment itself; whereas the same pigments ground in coach japan cannot possibly possess that clearness essential to glaze effects. The reason for this is obvious—shellac japan customarily used for grinding is a heavy blackish-brown vehicle almost like an asphaltum varnish. A liquid of this character simply cannot avoid muddying fancy colors, therefore the resultant application is, in effect, opaque instead of transparent.

However, the inquirer may have certain reasons for preferring the japan colors, but encounters difficulty in using them on account of their rapid-drying properties. In that assumption, I advise a suitably prepared medium or liquid for the mixing and applying of japan colors. It is understood that the purpose of a glazing liquid is to keep the colors wet or "open" sufficiently long to allow ample time for application and blending. The so-called flatting liquids, and mixtures of turpentine and benzine with boiled linseed oil, would not maintain the desired moist condition of the colors over enough lapse of time. The liquid glazing compound to be recommended in the present case is the following, which H.F.R.& R.S. could have made special for them by any paint manufacturer. This liquid possesses all of the essential characteristics, and may be used for both mixing with the

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japan colors and also alone as the initial coating over the underbody color prior to applying the glaze color mixtures. The composition is:

First, prepare an emulsion liquid by dissolving ¾-oz. of "Champion" 98% lye, into 3-qts. of water, stirring this gradually into a mixture composed of 2½-gals. of raw linseed oil, and 2½-gals. of paint oil.* Next, grind very fine a paste made of 12½-lbs. aluminum stearate, ½-lb. stearated oil†, and 4½-gals. of emulsion liquid. Finally, whip the ground paste and reduce to liquid consistency ready to use, by adding gradually 1¼-gals. emulsion liquid, 1-gal. pale japan drier, 3-gals. turpentine, and 15-gals. of mineral thinner.

The above formula produces 25 gallons of glazing liquid and is best made in a regular paint-mixing tank by mechanical agitation. *Do not add all of the naphtha*, but hold the batch until the next day for some thickening to take place, and then finally reduce as specified or more-or-less according to the consistency the consumer might be accustomed to using. Keep in mind, however, the necessity of a sufficiently light body, so that the liquid will properly thin out the colors in japan for application. *Do not be afraid that the colors might run*, as this glazing liquid even at light body holds the glaze or stippling mixtures intact where applied.—E. Perry.

---

* This may be any high-grade paint oil or japan oil.
† This is simply a combination of stearic acid and linseed oil, using as proportions 2½-lbs. of the former to a gallon of raw oil; combining same by dissolving the stearic acid into the heated oil at about 200°F.

Machine Tool Castings

I am interested in methods and materials used in applying enamels to iron castings, such as are used on printing presses, machine tools, etc.—H. J. B.

In the first place it is practically necessary to have a perfectly clean, dry, rust-free surface, regardless of the kind of finish to be applied. Many concerns use the sandblast method of cleaning large iron castings, and then follow up with a portable grinder to remove all burrs and smooth up the excessively rough places. After this treatment the surface is generally cleaned with blasts of compressed air.

The first coat can be lacquer primer sprayed on and allowed to dry for about one hour. Then will follow putty glazing, applying pyroxylin putty to any holes or rough uneven places and letting this dry thoroughly. The puttied surfaces must be smoothly sanded and cleaned with a jet of compressed air.

What follows will depend upon how high a quality of work is specified or how much finishing cost is permissible. The schedule from here on may include a lacquer surfacer, a lacquer sealer coat and a lacquer enamel, each coat being sprayed on. It is not advisable to machine the castings after these final coats are applied.

For a higher quality, smoother finish job, I suggest spraying on one or two coats of pyroxylin filler after the putty glaze has dried and is cleaned up—allowing about 2 hours drying time after the first coat and from 4 to 12 hours after the second coat.

In some castings having numerous curves, extensions or flanges, it is advisable to knife the filler

coats on the surface. This may be done either with a flexible knife or with a piece of leather. You will find that it is practically impossible to spray filler on a curved surface with any degree of success.

White Spots on Finish

I would like very much to know the cause of white patches and streaks on lacquered radio cabinets and the cure; also I have a job on a walnut dining room suite that has turned gray blue when in the home. I am thinking of trying a spray of lacquer thinner. Of course I hope that the suite, which is six years old and high grade furniture, was originally finished in lacquer and not varnish, although perhaps if the finish is varnish it is now so hard that it would take lacquer when softened by a spray of lacquer thinner.

What do you think of wiping the surface with alcohol and then setting fire to the alcohol remaining on the surface? This sometimes removes gray or white spots. I will be very grateful for any ideas that readers of INDUSTRIAL FINISHING may care to suggest. —D. N.

The white patches and streaks on radio cabinets were probably caused by the presence of moisture in the veneer when the lacquer was applied. Due to the texture of the wood, some areas in a veneered surface seem to retain the moisture from the stain, and if not permitted to dry thoroughly will cause the lacquer to bloom. To prevent this, it is advisable to allow a longer drying period for the undercoats.

On a finished surface over which the bloom appears, you may spray lacquer reducer and correct this trouble. I have heard of the alcohol burning method of removing white and gray spots, but believe the lacquer reducer method superior. The alcohol burning method has a tendency to take the life out of the finish and will often result in cracking and crazing of the finished surface at varying periods after this operation has been performed.—P. B.

Lacquer Dries in Spots

I operate a refinishing shop, and when changing over from a shellac and varnish system of finishing to the lacquer system, I encounter considerable trouble with the lacquer coats drying in spots. What is the cause of this trouble?—A.H.

One is likely to encounter this trouble here because of the residue of wax from the removers left on the surface. When using shellac, there was little trouble from this source but lacquer materials are antagonistic to wax or oil, and if a trace of either is left on the surface there is likely to be a soft spot for a time and frequently a white spot when the lacquer does dry.

To prevent reoccurance of this trouble be sure to wash off the removers with soapy water, and then rinse the surface with naphtha or better still, a lacquer cleaner, before coating with lacquer sealers or lacquer. Be careful to scrub all grills, flutes, carvings and turnings when cleaning the surface.

To repair a spot that is soft from non-drying, use a lacquer cleaner and with a brush or rag, remove the material on the soft place. When the spot is removed, recoat

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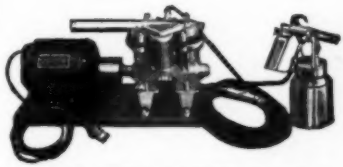

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the exposed surface with a spray of the lacquer, which will blend into the surrounding finish; then rub when dry to match the rest of the surface.—C.N.L.

Dip Finishing Problem

I would like some advice as to the best and cheapest way to finish 1,000 towel racks in a semi-gloss, non-baking enamel. These articles weigh about 3-lbs., are approximately 10x18-in. in size, and are composed of two brass brackets, joined together by three pieces of ⅜-in. square, iron rod. If you suggest dipping, please tell me what kind of lacquer to use for this purpose. My experience is almost limited to working with the spray method.—J. M. T.

Your inquiry is not quite clear inasmuch as we don't quite understand the shape of the towel racks you intend to dip. However, we can give you some information along the line of dipping that very likely will help considerably.

In dipping any product, one of the foremost considerations is that the product must be so shaped as to afford a ready flow of the material off the article itself. It is usually hard to get a satisfactory dipped finish on any article that has a number of points, sharp corner, or short-radius curves, because these surfaces do not readily "hold" liquid finishing materials—unless they happen to be the lowest points when the articles hang up to drain.

Invariably where you have a square, iron rod with sharp corners to dip finish, the rod is dipped in the lacquer enamel and withdrawn, so that the material flows off lengthwise of the rod; the finish adheres to the flat surfaces of the rod but not to the square corners.

Satisfactory results, however, are sometimes accomplished on articles of this type by double dipping them—that is, withdrawing the rod from the first lacquer dip on a slant and allowing the finish to dry, and then dipping again, holding the article at a slant in the other direction when it is withdrawn the second time.

In your particular case, we recommend that you dip the towel rack from one corner, allowing the material to flow off very slowly by taking the racks out of the dip tank slow enough to allow the flow off the rods to remain even with the top of the lacquer. This will assure you of the best covering possible. It will also prevent any possibility of runs or sags in the finish.

In reducing dipping lacquer, a special dipping thinner should be used and the material should not be reduced as much as it is for spraying. In other words, the consistency of the lacquer for dipping should be considerably "heavier" than for spraying, but not so heavy that it does not flow off readily.—James B. Day & Co.

If the finish required must be cheap but good, I recommend dipping the racks in a synthetic oil-enamel. This material will cover with one coat in every color except white or light yellow, which will require two coats. It will air-dry over-night or force dry in about two hours at 200° F.

However, unless you are equipped with a mechanical dipping device to "draw" this work slowly from the lacquer, then I am sure you will experience difficulty in attempting a lacquer dip.

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CHECK THESE FEATURES

1. SKINNING—Can be sprayed from drum and remain uniform without skinning.
2. TRANSPARENCY — Is quite transparent, not showing milky on dark finishes even on two coat work.
3. DRYING — Dries to hard film overnight.
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6. BODY—Has good full body.
7. SHEEN — Furnished in four grades, varying from dead flat to light rubbed finish.
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THIS improved flat rubbing varnish has been hailed by many manufacturers as one of the most important advances in finishing in recent years. They find that it meets the needs of present day production methods—that it gives a better job in less time—and that it materially reduces production costs.

We are anxious to have you know this product and are making a special offer of a 5 gallon can at drum price. Take advantage of this offer to try this varnish in your own plant. Write for your five gallon can today. Additional data will be sent on request.

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finish, I suggest a spray coat of a high gloss, adhesive spraying lacquer which will do an excellent job, particularly in white.—A. B. Laboratories.

Vernis Martin Finish

The description of this 18th century finish given on page 40 in the October issue is correct to the point of final varnishing, but a pale clear varnish should not be used. The American conception of this French metallic finish is not that of a natural gold-bronze color effect which the described finish would be; it is a characteristic rich-gold shade like "golden rod." and is produced by a finishing varnish prepared specifically for this particular purpose.

Vernis Martin is strictly an industrial finish; undoubtedly the largest usage has been for bedsteads of the large tube style, and perhaps the next principal usage is still for the making of picture molding. The former was altogether baked finishing, whereas the latter would have to be entirely air drying. For both purposes the finish may be either bright (gloss) gold or satin (dull) also termed "velvet."

In all of these products a special Vernis Martin coloring is used, made as follows:

Yellow lake No. 8*.....5-lbs.
Varnish .....6-pts.
Bleached linseed .....1¼-pt.

The following are typical examples of the various finishes which were popular and extensively used when Vernis Martin was in vogue:

Bright Gold, Baking

V-M coloring base.....6-lbs.
Pale baking varnish.....50-gal.

Dull Gold, Baking

Magnesium carbonate .....36-lbs.
V-M coloring base.....7-lbs.
Pale baking varnish.....40-gal.
Gum turpentine .....20-gal.

Bright Gold, Air-Drying

V-M coloring base.....8-lbs.
Pale air-drying varnish.....34-gal.

V-M Lacquer†, Air-drying

V-M coloring base.....22-lbs.
Air-drying varnish .....72-gal.
Turpentine .....9-gal.
M & P Naphtha.....9-gal.

This "dull" gold finish is also variously referred to as satin fin-

---

* This is an aniline dyestuff and may be obtained from a concern whose name will be given upon request.

† "Lacquer" was a term correctly used for thin-varnish type materials during the period when Vernis Martin finish was popular, which was considerably prior to the advent of our present nitro-cellulose lacquers.

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ish, velvet finish, and roman gold. The carbonate of magnesia is the main flattening agent and must be ground impalpably fine by the paint manufacturer to insure against any graininess on the finished work. The same product may be made by starting out with a regular baking type of dull-finish varnish, and incorporating the coloring base as before. The color base specified is of heavy cream consistency, easily stirred into the varnishes.

In all of the foregoing formulas "pale" varnishes are specified because naturally-dark varnishes would sufficiently "muddy" the resultant finish as to detract from the beautiful clarity and depth of the true Vernis Martin.

There is also one other manner by which the colored finishing varnish was produced by those manufacturers supplying it in a large way. A golden-yellow drying oil designed especially for Vernis Martin, oil gold lacquers, and gold bronze varnishes, was first prepared, later to be incorporated in the varnish; and using the varnish as such, or with the addition of the same coloring base but in lesser amount. This vehicle was China wood oil cooked in the kettle with lead acetate (sugar of lead) and slaked lime. During the heat treatment the acetic acid from the lead acetate unites with the slaked lime and forms "calcium acetate"; it is this, in conjunction with the lead oxide (lead acetate converted by calcium oxide), which colors the oil an orange-yellow shade. Formula and data may be obtained, gratis, from the author.—E. Perry.

One of the most pleasing developments in America during the last 15 or 20 years is the recognition that beauty pays.

Oil-Rubbed Lacquer, Gray

Very often an oil-rubbed lacquer surface will show a pronounced grayish cast which is almost impossible to rub out, and in nine out of ten cases the rubbing oil is blamed.

This is not always the cause, for the same effect will show up if lacquer is rubbed too soon, before it has had a chance to thoroughly dry, or if it has been rubbed too hard. If the latter is the case, it is probable that some of the pumice has been ground into the surface, and as the oil dries, the pumice will resume its natural color, giving a grayish cast to the surface.

It is impossible to give any set standard time for lacquer rubbing after application—one that will fit all cases or all kinds of lacquer—since some may be rubbed successfully within 24 hours of application, while others s h o u l d await at least 40 to 48 hours. Because of the fact that an article may be recoated within a time varying from 2 to 8 hours is no indication that the lacquer will be sufficiently dried to permit rubbing with oil in the same length of time.

Each concern should experiment to find the best rubbing time, according to the grade of lacquer used and local conditions, and the management should be certain of this time before going into volume production. If a grayish cast is present it may be due to the fact that all of the oil has not been rubbed off, and since oil is not a nitrocellulose solvent it may cause precipitation of the cotton with the attendant result of a grayish cast. Sometimes this is mistaken for lacquer blushing through conditions of humidity. —C. D. Y.

There are some things that can't be done

Lac: "This summer I watched some circus men trying to get a five-ton elephant into a six-by-six foot box car door. It just couldn't be done!"

So it is with trying to produce brilliant, durable, lasting lacquers with cheap materials—it just can't be done. Good lacquers require good materials, especially reliable solvents and thinners.

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when properly formulated, produce lacquers that are competitive in cost, and, at the same time, will not blush and which produce a film of lasting quality and brilliant finish.

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By P. KRIEGEL

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AMONG the manufacturers of electric watt-hour meters, the Sangamo Electric Co., Springfield, Ill., is one of the outstanding. The capacity of the plant is enormous, and the operating departments from the cleaning of base castings through the heat treating of magnets, wire coiling, machining, polishing, plating, finishing, assembling and testing, all function smoothly in a steady flow of work with minimum lost motion. Each operator is carefully trained in his or her particular function, because precision is of first importance. As one small part is produced, it is moved down the line immediately to be assembled with another part. Inspection of all parts is rigid.

It is in the production of the shunt and series coils, coil-magnet assemblies, their insulation and baking, the drilling and grinding of grid and base castings, their finishing and baking, all leading up to the final assembly and testing, that the greatest general interest lies; indeed, it is in these particular operations that some important changes in production

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Not a paint, but a Primer, which when applied to galvanized metal leaves a neutral base, neither acid nor alkaline and combines with zinc to form an alloyed coating effectively sealing the pores of the zinc and absolutely preventing peeling, chipping or cracking.

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will produce a smooth surface upon which to apply top coats. It has exceptional covering qualities, will not bleed through, is elastic, and has great adhesive properties. It positively prevents paint from cracking or chipping off Steel, Iron, Copper and Solfo-treated Galvanized Metal.

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1. SOLFO METALLIC COATING
2. SOLFO No. 5

Firm .....
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methods have been made within the past two years which have effected cost reductions, speeded up production, and improved general working conditions.

All operations in connection with the winding and taping of coils, the assembling of coils and yokes, and all operations on the cases and grids prior to finishing are grouped around two conveyor ovens, so as to feed centrally toward these ovens. The coils are made by winding cotton-covered, enameled copper wire on winding arbors. They are then carefully hand-wound with linen tape, and are thereupon ready for the application of the black insulating varnish coats and the subsequent assemblies with the yokes and permanent magnets.

At this point it is well to describe the continuous conveyor ovens which handle all the baking operations in all the intermediate and final operations. The varnish-baking unit consists of a preheat oven, an automatic dip and drain section, and a baking oven having a total over-all length of only 34-ft., including all outside structural steel supports and conveyor projections outside of the oven. The over-all width is 7-ft., 3-in., and the height 14-ft., 8-in., to the center line of the exhaust ducts. Both ovens are of insulated steel panel construction, with panels being held together by expansion members.

One conveyor unit passes continuously through both ovens. It consists of two matched strands of roller chain with extended pins on definite centers, supporting pipe flights from which the work is suspended. At the loading end the conveyor travels downward, then upward into the preheat oven moving in a vertical position in several passes, then out and over the varnish dip tank and drain section and into the baking oven, making a number of up-and-down passes; it emerges at the bottom of a heat seal at the other end of the oven for unloading, then passes over the entire oven structure to the reloading end. This is illustrated in the accompanying line drawing, showing the relative sizes and distances between the two oven units, and the number of passes the conveyor makes vertically over and under the sprockets.

With a predetermined time cycle for the operation, it takes eight hours and 50 minutes for the conveyor to make one complete turnover, of which 1¼ hours are in the preheat oven, 38 minutes from the point of varnish dip to the entrance of the baking

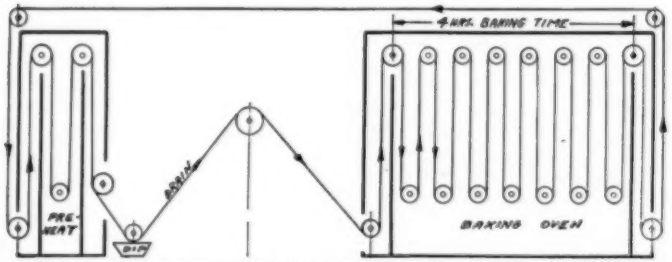

Diagram showing conveyor travel through the preheat, varnish dip, drain and baking sections. Note the total length of conveyor travel in relation to the over-all length of the oven unit.

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5 OUTSTANDING ADVANTAGES

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No special thinner.
Covers solidly.
Adheres perfectly.
Glass-like finish.

It Looks Like Glass

SPRAY one of your jobs with one coat of BERCO "Glisson" Enamel. Bake it three hours at 175 degrees or air-dry overnight.

Then examine the glass-like finish closely. Notice how solidly it covers. Try to chip or mar this film and see how tough and elastic it is.

Manufacturers making products as different as bread boxes and metal furniture are using BERCO 1-Coat "Glisson" Enamel to get a better finish at lower cost. Its use saves spraying time. It requires no special thinner. It does not "paper print" or "orange peel."

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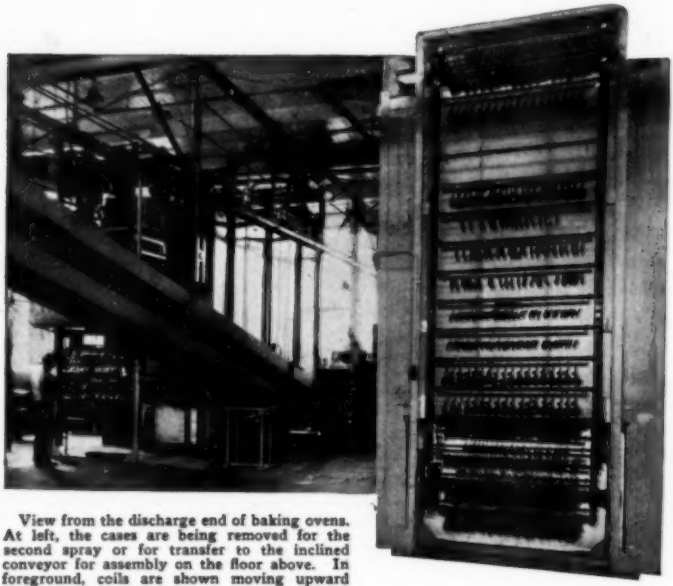

View from the discharge end of baking ovens. At left, the cases are being removed for the second spray or for transfer to the inclined conveyor for assembly on the floor above. In foreground, coils are shown moving upward and over entire oven structure to original loading point.

oven, and four hours in the baking oven.

Both oven units are gas heated with drilled pipe, baffled burners.

The baking oven is heated by an indirect gas vertical radiator system employing full heating chambers, thereby providing maximum radiating surface; this keeps the heat gradient at the lowest point possible, giving perfect heat distribution and full heating capacity while assuring the great fuel efficiency. At the same time, because of this indirect heating method, the products of combustion and moisture do not enter the baking compartment, thus keeping the varnished work clean. The preheat oven is vented by natural draft, while the baking oven is provided with a series of ducts leading to a single outlet vented by a motor-driven exhaust fan.

The temperature in the preheat oven is 150° F. and in the baking oven 280° F., both being automatically maintained by thermostats and charted by recording thermometers. Because of the scientific application and control of heat and ventilation, the operating temperature varies hardly more than two or three degrees from the desired point.

The japanning oven used for baking the bases, cases, return plates, and miscellaneous metal pieces, is similar in design and construction to the varnish-baking oven. It is 24-ft., 6-in. long, 7-ft.,

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1-in. wide and 16-ft., 8½-in. high, and is of steel panel assembly, using more insulation than in the varnish oven because of higher baking temperature. It employs also the same type of heating, ventilation for the removal of volatiles and japan fumes, and temperature control system to maintain a uniform operating temperature of 360° F.

The two-strand conveyor is likewise of the vertical-loop, multiple-pass type, with all conveyor supporting members independent of oven structure proper. It is driven by a worm gear reduction unit and variable speed transmission, gears and shafting for operation and speed control of conveyor travel.

The work is sprayed and hung on pipe flights, entering the oven through a bottom heat seal, then up into the oven for a number of loops over and under sprockets, then out for a definite cooling period; it unloads at the other end, the conveyor then returning over the oven to the loading end. The actual total baking time is one hour, 51 minutes, with three hours and five minutes being required for a complete conveyor turnover.

The coils and coil assemblies are routed through the oven in groups of five flights. The work is hung on rods which in turn are suspended on the conveyor flights. Each group of work is tagged for identification. The coils are thus sent in one group through the preheat and baking ovens for the first varnish coat, followed by a group of coils for the second coat, then by one for the third coat. The leads of the coils are then ground to give metallic contact for terminal connections.

At this point the laminated series yokes, the face of which had been sprayed and sent through the japanning oven, are assembled with the coils and hung on the conveyor just beyond the varnish dip and carried through the oven for another bake. Operating data show that with a complete conveyor cycle of nine hours it is possible to preheat, dip, and bake approximately 14,800 coils in a one-shift day.

The work to be sent through the japanning oven is prepared on a series of benches just beyond the unloading end of the oven.

Both the grid and base castings, after being machined, are blown off with an air hose to remove filings, chips, and dust, and are made ready for the spraying operation. Six spray booths are located at the left of the oven. The castings and yokes are given a black japan finish, and hung on rods suspended from the pipe flights of the two-strand conveyor.

Upon reaching unloading height at the opposite end of the oven the work is removed, given another japan coat, and again sent through the baking oven. The bases are then coated in the interior with aluminum paint, fitted with dowel and hinge pins and sent up the belt conveyor, located at the right of the japanning

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DIVISION OF ROSS INDUSTRIES, CORP.

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You should have a demonstration of how the Teglac Lacquer System can aid your sales and cut your production costs. Without obligation we will tell you the complete Teglac story.

Industrial Chemicals Division

American Cyanamid Company

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oven; they thereby reach the floor above where the assembly of coils, magnets, moving parts, and grids into the base and final testing takes place.

With an average load of about 4100-lbs. baking in the oven, and a complete conveyor time cycle of three hours, 8000 castings of varying sizes are produced per nine-hour day of oven operation at the desired temperature.

While this conveyorized method of finishing and handling necessarily applies to parts of which the production is standard and large in volume, there is also an appreciable production of special sized polyphase meters, switchboard meters and the like, as well as electric clock cases which can not be thus handled.

For the winding and treating of the larger coil assemblies and the finishing of cases for the special meters and various colored clock cases and clock backplates, there is a special department adjoining the main finishing room. Here are installed all mechanical facilities for preparing the work for finishing and a number of box type ovens for baking. All of the meter cases and coils are loaded on trucks and run into indirect gas-heated ovens for a definite period at about the same temperatures as in the conveyor ovens.

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For Color Beauty
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Midwest Representative
M. L. Freud, Wolverine Hotel
Detroit, Mich.

The coils and coil yoke assemblies are of course preheated, dipped and baked three times, and the grids and meter cases are japan sprayed and baked twice.

The electric clock cases—for the most part finished in white enamel for kitchen use—are preheated at 200° F., then sprayed, baked, sprayed again and baked again at 180° F. This work is accomplished in several closed-type, indirect gas-heated ovens. Here a clean, unpolluted oven atmosphere is important for proper baking of the light color. The production of all this special work being limited and variable in size and quantity, operation in this department is on an intermittent basis.

Before a conveyorized system of production was installed, all baking operations took place in box-type ovens. Loaded trucks constantly cluttered up floor space before being pushed into the oven, while work in baking process underwent the proper baking treatment. Handling of work from the benches to the trucks, loading and unloading ovens and trucks, required considerable labor and waste motion. Work being processed piled up, involving necessity for storing castings and other parts which could not be absorbed in subsequent operations; investment in unfinished inventory was thus considerable.

With the necessity for opening and closing of oven doors in loading and unloading the trucks, occurred loss of heat, drop in temperature and consequently an increase in the amount of time required for the baking period. That the installation of the conveyor ovens for varnish and japan baking to handle all possible large production parts was warranted, is practically self-evident.

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A product chemically engineered to give a long-awaited finish for refrigerator boxes, vending machines, hospital equipment or anywhere that a uniquely superior Lacquer Finish is desired.

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Point 2. Minimum Discoloration.

Point 3. High opacity combined with smooth flow and lustrous sheen.

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Point 5. Marvellous resistance to water, oil, sulphur dioxide gas, and actinic rays.

Point 6. Write us for this and further information on our "SIX POINT" White System.

The Varnish Products Co.
Cleveland, Ohio

N. B. "6-Point White" can be tinted to a wide range of desirable pastel colors.

The varnish oven occupying an over-all floor space of 240-sq.ft. and the japan oven of 170-sq.ft., totalling 410-sq.ft. require considerably less room than the box-oven originally used. Yet it is interesting to note that the total length of conveyor is about eight times the over-all length of the predrying and varnish-baking unit or the japan-baking unit. All truck loading and all trucks have been eliminated.

The reduction of fuel costs due to the maintenance of proper temperature uniformly at all times and to quick heating up is appreciable. The quality of work is considerably improved because every piece goes through exactly the same predetermined operating cycle automatically as every other piece, thereby being more uniformly dipped and baked.

The elimination of hand dipping of coils, which at best is empirical, and the substitution of automatic dipping plus a constant rate of withdrawal are responsible for considerable savings in varnish. The reduction in labor costs in the varnish treatment of coils is 27% and in japan baking over 10%.—*Industrial Gas.*

Improved Method for Liming Rosin

The discovery of an improved method for liming rosin is announced by the naval stores' technical division of the Hercules Powder Co., Wilmington, Dela.

The new method, which was devised at the Hercules Experiment Station, results in the production of limed rosin of great clarity and hardness and in greatly improved gloss oils. It is stated by Hercules technicians that the procedure is very simple and may be used by any varnish maker or by almost anyone using rosin hardened with lime.

The naval stores department of the Hercules Co., at Wilmington, offers to furnish any interested person information on the improved method.

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Has unusual adhesion — hardness of baked finish — high gloss or dull — quick bake. High solids give exceptional build and toughness without brittleness.

Available in one coat white, black and solid colors for metal furniture, refrigerators, etc. Technical advice gladly furnished.

It stands the test!

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By BAY NIELSEN

Graining and Stencil Decorating Metal Furniture

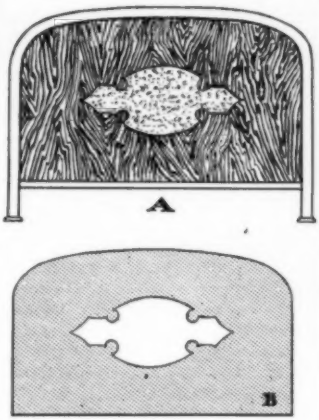
MANUFACTURERS of metal furniture are constantly pressed for new designs and new finishes, and I believe that the same applies to most other manufacturers as well. Sales departments are continually pressing the finishers for something new.

Finishers of metal furniture probably have a greater problem than most other finishers due to the limited possibilities of imitating various types or kinds of wood by means of undercoating and graining. Most of my experience in this field of finishing has been with metal beds.

I should like to pass on to you finishers a few of my ideas, and I hope some of you may find them useful. I'm not going to dwell on by-gone days, but you'll probably remember just a few years ago that all metal beds were hand grained, mostly oak and walnut, and we were pretty proud of our job. Then came the copper graining plates which enabled us to reproduce natural wood and at the same time speed up production. Those graining plates certainly were a great boon to the metal furniture business, and we had good reason to be proud of our job, giving due credit to the manu-

facturers of the graining plates.

Since graining plates and the necessary rollers are rather expensive equipment, most firms get along with one or two plates, thus eliminating much variation in the grained finish. To doll up the finished product, transfers or decalcomania have been used extensively to great advantage. It seems, however, that people have grown tired of transfers and de-



A metal bed end grained to portray a panel in walnut crotch figure with an overlay or inlay decoration of maple burl—and the stencil plates B, C and D which are used in connection with suitable graining rollers.

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The lustre is more durable and the finish is harder than that usually obtained with other polishes of this type.

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1. Free from solvents, non-inflammable and odorless.
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mand something new and different.

The effect of inlays, representing various kinds of veneers, such as walnut, satinwood, maple burl, feather walnut and many others, is what I have been working on lately, successfully applying them to metal beds. I see no reason why identical or similar effects cannot be applied to other metal furniture with equally satisfactory results.

In describing the method, I'm referring to beds because I am more familiar with beds.

Before coming to the finishing room, the surfaces of metal beds are thoroughly cleaned ready for the priming or ground coat to be sprayed on as usual. This priming coat must be lacquer resistant. It is safest to bake it at 180° F. for from 2 to 3 hours. The dominating color or finish being walnut, we use a walnut ground as a base color.

I'll try to explain the use of stencils, which are necessary for this job. For the finisher who is an artist and a skilled stencil cutter, the process is very simple. Those who are not familiar with that end of the job may have it done by an outside expert. I shall, however, try to explain a very simple combination of inlay effect, which any finisher should be able to carry out without outside assistance.

Illustration *A* depicts a full-panel bed end finished in plain crotch walnut with an inlay decorations of maple burl. Illustrations *B*, *C*, and *D* show the stencils necessary for the job. To apply the maple ground color, stencil *B* is placed on the bed in proper position, and an industrial lacquer of suitable light shade is sprayed through the stencil opening onto the panel. It is advisable to use

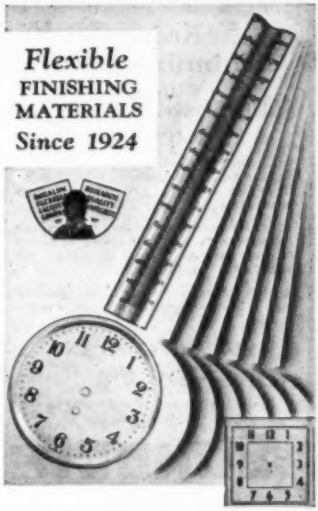
a small spray gun, such as is used for decorating purposes. It is safest to let the lacquer dry hard before graining over same.

In graining this job it is necessary to have two plates, one for walnut and one for maple burl. While the same graining ink may be used on both plates, it gives a better effect to use different shades. Now place stencil *C* over the decoration. This stencil should be cut so as to leave 1/16-in. showing all around the decoration. We are now ready to roll the walnut grain onto the panel; after this is done lift stencil *C* from the panel. You will notice that this stencil served to protect the maple ground.

To roll on the maple burl grain effect, place stencil *D* on panel, thus covering all the walnut grained part. This stencil also must be cut so as to show 1/16-in. of the walnut part; in other words it must be 1/16-in. larger all around than the decoration. Do not be afraid to place the stencil over the wet grained job; it will not mar it in any way provided great care is taken to avoid shifting the stencil while rolling on the graining ink. The next step is to take the impression off the maple plate and roll it over the area to be decorated. Lifting the stencil you will find a very attractive panel.*

I have not mentioned the sanding and preparing of the job, as I take it for granted that no finisher would overlook these important operations; also, he will know the next steps in finishing this job, namely baking, varnishing, rubbing and polishing. You will see that this process is very simple and inexpensive in comparison to the result, and you can well understand how easy it is to vary

*See further discussion at conclusion of article.



TEMPTATION proves too strong . . . . . we must, under the influence of these photos, write . . . *it is high TIME that you made some inquiry as to how, exactly, our flexible finishing materials might fit into your picture.*

The thermometer backing (*part of our improvised pendulum*) is a straight brass etching which has been sprayed with our *flexible* materials. Under heavy pressure it has been shaped without disaster to the *flexible* lacquer film. The clock dial was also *flexibly*-finished in the flat sheet and THEN blanked and formed.

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OUR PRICES WILL INTEREST YOU

the inlay designs with different stencils and plates.

The job just mentioned is very simple. More elaborate jobs can be produced by the use of more stencils, different ground colors and different plates.

Very few shops have a great variety of graining plates, as this is rather expensive equipment, but wooden plates of desirable veneers and properly prepared can be used successfully—and the fact that wooden plates must be replaced from time to time gives you another opportunity to change your designs.

Questions

After the editor had read the foregoing article, he put two questions to me as follows:

1. How do you keep the solid, centered stencil in position while rolling on the crotch walnut grain which completely surrounds it?

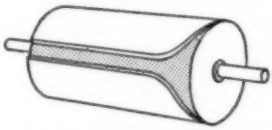
2. How do you manage to get your walnut graining roller up close to the raised bed posts and connecting rails? As we understand it, this metal panel, which is grained in walnut and burl maple, is perfectly flat, set inside the raised frame formed by the bed legs and connecting pieces. It would seem to us that the graining roller could not be forced into the corners around the outer edges of this flat panel—and if it were let up close, it would mark the frame which surrounds the panel.

Answers

My answer to No. 1 is that there is no danger of the center stencil slipping while the bed end is lying flat, but it is sometimes advisable to have a third man hold this stencil until the roller grips it.

Referring to question No. 2:

For a 4-ft. 6-in. bed end the diameter of the roller is 18-in.; other sizes are in proportion. The roller is cut in a shape to fit the panel. To do this, we first cut a piece of smooth flat paper to fit the flat panel inside the frame, then we take that pattern and place it around the roller, marking the curved outline with chalk. Then, with a sharp knife we cut away all unnecessary coating to the core of the roller as shown in the accompanying illustration.



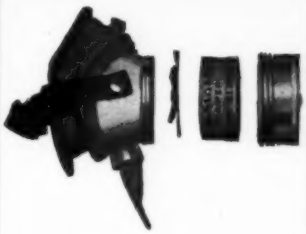
Graining roller cut to accurately fit bed end panel.

After this treatment we find that the roller fits exactly and touches the flat panel only.

It requires two men to handle a roller of this size and weight. It is rolled lengthwise or horizontally across the bed end. The same job may be done with three rollers, rolling up or down. In that case, one man can handle the job, but there is always the difficulty in matching the grain where the roller printing joins, and it requires too many rollers—right, center and left rollers. One roller operated by two men gives better results and is more economical.

Berco Finishing Booklet

The North Bergen Varnish Corp., 989 39th St., North Bergen, N. J., has ready for distribution its 15-page, illustrated booklet "Back of Berco," which contains information about the production of Berco finishing products.



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Industrial Finishing
MAGAZINE

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

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EDITORIAL

Thin Metal Coatings

The thin metal coating, of such great value on so many different products and parts of products, finds rather novel methods of application of late in some places where it is not feasible to dip or to electroplate. One such instance is in the manufacture of wooden airplane propellers. A perfectly balanced propeller may become considerably out of balance later if the finishing coats give away and allow moisture to penetrate the wood. Hence every precaution is in order to make them moisture-proof. To this end, no better means has been found than to cover the surface with an aluminum-leaf coating. This process, developed at the Forest Products Laboratory, is highly effective.

There is also the matter of protecting steel surfaces from corrosion, and in some cases this is accomplished by means of a spray gun which atomizes lead wire, and coats the surface with it about .004-in. thick. The spraying of the softer metals in this way also extends into the field of metal tinning, a spray gun having been developed for this purpose also. This gun is a combination of air nozzle and gas flame, and no acids are required for tinning when it is used. Still another gun of similar type can be used to spray any metal which has a low melting point, and is used for building up metallic surfaces, repairing dents in automobile bodies, and similar work.

Furniture Industry

A prominent furniture manufacturer said, "A great deal of none too favorable attention and talk is being focussed on the furniture industry." Unfortunately this is a true statement, and it applies both outside as well as inside the industry. The "outside" talk is the thing that is hurting the industry perhaps more than anything else, for it represents the consumer.

Continuing, this same furniture man hits the nail squarely when he says, "Instead of maintaining their standards of construction and price levels, members of the industry are destroying the very thing on which their business has been founded, and are losing their identity with the trade." Right now the furniture industry is not in need of conversation. Nothing can be gained from enlarging on the results that have accumulated from the conditions, whatever these conditions may be. Without question this furniture man deserves credit for truthfully voicing

the opinions of many who are intimately acquainted with the industry, and perhaps thousands who do not possess inside knowledge, but unconsciously feel the effects of the disorder.

Acknowledging a fault is the first step toward correcting that fault. One of the ways of correction is to produce a worth-while product and sell it at a price worthy of the merchandise. There is a limit to substitution and to cost-cutting methods in the mill-room, cabinet room and finishing departments. The lines separating low, medium and high-grade furniture should be definitely and clearly established. Then place in the hands of the consumer a definite method of identifying the class of furniture according to the price asked. At least such a move would clarify the industry in the eyes of the consumer and instill in him a confidence that at present is sadly lacking.

What a User of Material Expects

Some manufacturers of finishing materials would probably express their opinions in rather strong language if asked, "What does the user of finishing materials expect?" But after all isn't it a fact that every finish user does want *satisfactory performance* and *reasonable economy*, and isn't he entitled to it?

Manufacturers who have the goods, the facilities and the will to furnish their customers satisfactory performance and reasonable economy are in an enviable position and need not fear the competition that specializes in supplying something else. It is results that count, and whenever a user of finishing materials lets something else out-weigh the qualities just named, his company is going to find it increasingly difficult to sell its output in competition with firms whose products are being finished satisfactorily and economically.

However, there is one thing that often prevents the quality goods of a reputable company from giving the finish user satisfactory performance and reasonable economy. It is nothing other than lack of information on the part of the user about how to use the materials to best advantage. The manufacturer or seller of materials either hasn't given complete and specific instructions exactly suited to the nature of the customer's work or the user is not following the exact procedure that has been outlined. Here is a very weak link in many transactions between finish manufacturer and finish user.

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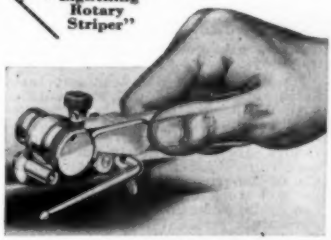

Oak Flooring Book

The Oak Flooring Manufacturers' Association announces the latest edition (the 39th) of its book "Laying, Finishing and Care of Oak Floors" which is just off the press. This completes a printing of 300,000 of these books so far this year, or a grand total of 3,900,000 to date. This new edition has been revised and improved, and contains much practical information for oak flooring prospective buyers.

News of Aluminum Colors, Inc.

Fred A. Wales has recently been elected President of Aluminum Colors, Inc. Mr. Wales became associated with this company shortly after it was organized in 1929, and in the capacity of Vice-President, was actively engaged in the development of the Alumilite process for treating and coloring aluminum and its alloys.

Ralph E. Pettit has been appointed Sales Engineer and will be identified with the promotion and sales service of the Alumilite process. Prior to his connection with Aluminum Colors, Inc., Mr. Pettit was in the research department of Aluminum Co. of America. In his new position, he will work on the development of the commercial applications of nickel, chromium and oxidized electroplated finishes on aluminum.

At the present time, Aluminum Colors, Inc., is the sole licensor for the Alumilite process—a protective and color coating for aluminum—as well as for the deplating process used in architectural applications for aluminum.

The offices of Aluminum Colors, Inc., have recently been moved from 401 Michigan Street to 537 East Washington Street, Indianapolis, Ind.

Classified Advertising

Advertisements under this heading 45 cents a line per insertion, minimum charge, $1.35. In estimating, calculate six words to one line, and add one additional line for heading. Use this department to obtain help, find positions, buy and sell equipment, dispose of manufacturing properties, etc.

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